Specification

Title of Invention

Air filtering chimney to clean pollution from a city and generate electric power

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Statement Regarding Federally Sponsored Research or Development

This invention is not Federally Sponsored for Research or Development.

Background of the Invention

This invention relates to a ***solar chimney*** arrangement. A ***solar chimney*** arrangement typically includes a ***solar chimney*** having an associated wind turbine, the wind turbine being energised in response to an updraft of ***solar***-heated air in the ***chimney***. Such an arrangement can be environmentally friendly.

In a known form of ***solar chimney,*** the air for use in the updraft is ***solar***-heated beneath a glass collector roof. To obtain a volume of heated air sufficient to effect sustained operation of a wind turbine of a size suitable for the commercial generation of electricity, the collector roof needs to cover a large land area, and is of a construction both expensive to erect and costly to maintain.

French patent 2,436,268 shows a ***chimney having a solar*** panel around its base, to form an air-heating chamber, whereby the air circulates normally i.e by natural in-draught from the outside to the inside of the container, to rise in the ***chimney*** stack.

It is the object of this invention to improve upon the efficiency of the known ***solar*** collection systems, by increasing the temperature difference between the base and the top of the chimney, decreasing the construction cost reaching higher altitudes and cleaning the polluted air from a city.

From one aspect of the invention we now propose a ***solar chimney*** arrangement which includes an air cleaning system by means of spraying a fine mist of electrically charged water, sprayed across the top of the tower, attracting pollution in the air like sulfur dioxide, soot and other particles.

From another aspect of the invention we propose a ***solar chimney*** arrangement in which a ***solar chimney*** is build using a mountain as support reaching higher altitudes increasing the preassure difference and improving the efficiency of the system.

The temperature difference can be increased by building the chimney so as the top of the chimney will be above the thermic ceiling.

Summary of the invention

A smog filtering system designed for a city that will generate electric power.

A solar chimney assembly including a chimney (3) is build using a mountain (9) as support. The chimney (3) receives air from a solar heat collector (1) and a turbine (2) is driven by the air. The chimney (3) will be as high as the mountain (approximately 1,000 meters high) and will go above the ***inversion layer*** or ***thermic ceiling*** (10). At the top of the chimney, a fine mist of electrically charged water (5), taken from a reservoir (4) is sprayed across the top of the tower, attracting pollution in the air like sulfur dioxide, soot and other particles. The water will be collected in a second reservoir (6) and will be used to send it down the mountain through a pipe (7) to generate electric power with a turbine (8).

Brief Description of the Drawings

The invention will be further described, by way of example, with reference to the accompanying drawing, which is a full view of the ***solar chimney*** arrangement according to the invention;

Detailed Description of the Invention

A smog filtering system designed for a city that will generate electric power.

A solar chimney assembly including a chimney (3) is build using a mountain (9) as support. The chimney (3) receives air from a solar heat collector (1) and a turbine (2) is driven by the air. The chimney (3) will be as high as the mountain (approximately 1,000 meters high) and will go above the ***inversion layer*** or ***thermic ceiling*** (10). At the top of the chimney, a fine mist of electrically charged water (5), taken from a reservoir (4) is sprayed across the top of the tower, attracting pollution in the air like sulfur dioxide, soot and other particles. The water will be collected in a second reservoir (6) and will be used to send it down the mountain through a pipe (7) to generate electric power with a turbine (8).

At the base of the chimney a solar heat collector (1) is build to heat the incoming air. This collector will have a glass collector roof and will use a surrounding area.

The result will be that because of the pressure difference at higher altitudes and the temperature difference, the air will go up achieving high speeds. At the bottom of the chimney a turbine or an array of wind turbines (2) will generate electric power moved by the upward air.

At the top of the chimney a fine mist of electrically charged water (5), sprayed across the top of the tower, would attract pollution in the air like sulfur dioxide, soot and other particles.

To collect the smog-filled mist, a second set of sprayers would send larger water droplets into the air to bond with the smaller pollution-laden mist particles. These droplets would become heavy and fall into collection trays. The water will be collected in a reservoir (6) and will be used to send it down the mountain through a pipe (7) to generate electric power with a turbine (8). After the turbine, the water will be treated and cleaned before dispatching it.

In the cases where no water is available at the top of the mountains or costs are too high to elevate the water using pumps, the fine mist of electrically charged water can be applied at the bottom. In this case, the mist would be with hot water to avoid a drop in temperature that could reduce the speed of the airflow.

This invention is designed for cities as Santiago de Chile that have certain characteristics: Polluted city, Smog is trapped in a large valley where the city lies, ***inversion layer*** or ***thermic ceiling*** above the city not allowing the smog to escape. In some cases like Santiago, there are mountains next to the city where the chimney can be build lowering the construction costs.

Chimney: The chimney can be build as a stand alone chimney or using a mountain as a support, which means that the chimney will have an angle. This will depend on the topographic characteristics of the site. The chimney will be build in concrete in the case of a stand alone chimney and in the mountain case, will be build using different materials including concrete, and alternative embodiments of plastic or polymeric materials, e.g.,. Kevlar, polymer, polyvinylchloride (PVC), polycarbonate, or similar materials. The use of these materials will increase the temperature of the air flowing through the chimney increasing its speed.

The heat collector will have a height above ground level of approximately 2 meters. The collector roof, can be constructed in glass, but in alternative embodiments of plastic or polymeric materials, e.g., KEVLAR.RTM. polymer, polyvinylchloride (PVC) or the like.

The turbine and generator will desirably be selected to be of a size to generate electrical power for supply to the national grid (9), but alternatively can be for local supply as to individual industrial units.